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(54) Title: **APPL PROTEINS AS RAB5 EFFECTORS**

(57) Abstract: The present invention relates to an in vivo-assay to screen for anti-proliferative drugs, the assay comprising the steps of: (a) contacting cells of a primary cell culture or of an established cell line with a candidate substance, (b) subsequently or concomitantly with a candidate substance, contacting the cells with a growth factor, (c) processing the cells for immunofluorescence staining to detect APPL1 and APPL2 using an anti-APPL1 and/or 2 antibody, or alternatively using GFP-tagged APPL proteins stably or transiently expressed by the cells via transfection, (d) assessing the degree of colocalisation of APPL1 and/or 2 and the growth factor, the solubilisation of APPL1 and/or 2 and their translocation to the nucleus, (e) repeating steps (b) to (d) with cells not previously treated with the candidate substance, and (f) comparing the degree of colocalisation of APPL1 and/or 2 and the growth factor, the solubilisation of APPL1 and/or 2 and their translocation to the nucleus between the cells not previously treated with the candidate substance (untreated cells) and cells treated with the candidate substance (treated cells), wherein an altered degree of colocalisation of APPL1 and/or 2 and the growth factor, an altered solubilisation of APPL1 and/or 2 and/or their altered translocation to the nucleus in the treated vs. the untreated cells identifies the candidate substance as an anti-proliferative drug.

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